

2025**(Session : 2022-26)***Time : 3 hours**Full Marks : 75*

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A**(Compulsory)**

1. Answer all questions : 1×5 = 5
- (a) What is one component system ?
 - (b) Define rate constant.
 - (c) What do you understand by rate of reaction ?
 - (d) What is the basic principle of B.E.T equation ?

- (e) What effect does a catalyst have on an equilibrium system ?
2. Distinguish between the order and the molecularity of a chemical reaction with example. 5
3. What is adsorption ? Define the terms 'adsorbent' and 'adsorbate' given suitable examples. 2+3 = 5

Group – B

Answer any four questions of the following :

4. Derive an expression for the rate constant of second order reaction assuming the initial concentration of both the reactant to be the same. 15
5. Give the labelled phase diagram of water system and discuss the importance of various points, lines and areas. 15
6. (a) What are adsorption isotherms ?
(b) Discuss Freundlich adsorption isotherm of a gas on a solid. 3+12 =15

HD – 107/2

(2)

Contd.

7. (a) What is meant by the term catalyst ? Give general characteristics of catalytic reactions. 7½
- (b) Write down the mechanism of enzyme catalysis suggested by Michaelis and Menten. 7½
8. (a) State phase rule and define the terms involved. 5
- (b) Deduce thermodynamic phase rule equation viz, $F = C - P + 2$. 10
9. Write short notes on any three of the following : 5×3 = 15
- (a) Nernst distribution law
- (b) Acid-base catalysis
- (c) Activation Energy
- (d) Characteristics of first order reaction
- (e) Collision theory of reaction rates



HD – 107/2 (400)

(3)

FYU-ESUE(VI) —
Chem (MJ – 13)